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Teleprompter Script for Ms. Khine Latt, Program Manager,
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Maritime Challenges

» **KHINE LATT:**

At the last DARPA Tech,

I stated in my speech:

“...Maritime supremacy is still the most effective means to project power.

The world's oceans cover two-thirds of our planet.

It's the medium over which no sovereign can veto our movements.

And it's the medium in which US dominance is exercised globally...”

How do we exercise our dominance in the new strategic environment?

We are a maritime nation and, unquestionably, the maritime environment is part of our strategic environment.

Our combatant commanders use the oceans for transportation and sustainment of expeditionary forces, and as a secure maneuver space for these forces.

For them, the ocean is a means to an end.

Most of the world's population lives in coastal regions near the oceans.

Maritime nations around the world are expanding territorial boundaries toward the oceans.

Competition for resources is extending out to the oceans.

And balances of power are continually shifting.

How are maritime challenges affected and where are the opportunities?

Maritime challenges are fundamentally driven by the unique challenges posed by the ocean environment:

the physics, the climate, geology and topology, marine life, and the geography of adjoining land masses.

The ocean is complex, dynamic,
very unpredictable,
and it's just plain HUGE.

It's typically hard to get from Point A to Point B.

It's very hard to monitor everywhere and at all times.

It's hard to work in without expending a lot of resources getting there, staying, surviving, and effectively doing the job.

Back in 2005,
I spoke about some of
the challenges.

Let's take an inventory:

I talked about offboard systems supplementing a shrinking maritime force by serving as sensor and communications nodes, linking the above-water and below-water battlespaces, and able to operate in harsh conditions.

Offboard systems are making an appearance in Fleet exercises, but we still have far to go in making them reliable and available when and where they're needed.

I talked specifically about undersea challenges: platform speeds and ranges, sensors, and communication.

Speeds and ranges are part of the energy and power trade space dictated by volume constraints, and we're working on these.

We've shown that we can design an underwater power plant that will extend the combat radius of a unmanned undersea vehicle by more than 10 times... a power plant that can be used for propulsion of underwater transport vehicles, as well as perhaps a deployable underwater generator.

And we're working to show that we can deliver Special Force missions in excess of 10 times the speed of today's craft.

I talked about undersea sensors and communications.

The physics challenges haven't changed.

We're faced with severe and variable attenuation, multipath spreading, and long propagation delays in the acoustic medium; and exponential absorption and scattering in the water transmission bands.

We are still confronted with these challenges.

We've explored the limits of passive sonar for decades now, and have substantially developed active sonar capabilities.

Passive and active systems have their respective advantages.

So can we develop a new sonar advantage, without compromising stealth?

And can we implement active sonar in environmentally-friendly ways so we can train as we fight?

What other means of sensing can we exploit that aren't complex, power hungry, or expensive?

In underwater communications,
we've started to look at some new ideas,
both by exploiting new approaches that rely on novel physics,
and by leveraging the telecom industry.

Maybe there are other theories to zap data through the medium before it breaks apart,
or innovations that take advantage of expanding infrastructure...
but the big wave has yet to come in this field.

Suffice it to say,
we have some tough fundamental challenges.

While the fundamentals don't change, a new strategic environment MUST motivate how we deal with them.

Our maritime forces generally have indiscriminate right of passage in the open seas, but in the world's littoral regions, sovereign rights are exercised in territorial waters that may reach out as far as 200 nautical miles off-shore.

In these regions,
we rely on allies for fuel, supplies, safe harbor and safe passage.

Over 90% of world trade passes through straits we don't control.

Many countries are purchasing sea denial technologies.

The near-shore and extended littoral zones are ripe for contested ownership and use.

Further out, the ocean with its vast resources is becoming increasingly important, and maritime nations around the world are competing to capture rights to oil, mining, fishing, and farming.

The ocean itself is a source of nearly unlimited energy.

Competition for rights and resources is the natural catalyst for hostilities.

Add to that denial resulting from piracy,
local insurgencies, and terrorism.

Our maritime strategic environment could change overnight.

The situations we face will be socially and politically complex.

We may have the maritime analog of urban operations.

We must be present, to act on a moment's notice.

We will need to watch and wait from distant ranges, and prosecute with speed and precision.

Unintrusive measures for situational awareness and assessment will have to be employed.

--How do we identify civilian boats as friend or foe?

--How do we track the foes?

--And how will we identify when a friend or neutral changes to a foe?

--What kinds of discriminators will be effective when we are drowned out by sheer numbers?

For example, what are the sonar tracking clues for surface traffic when we have previously treated minor returns from them as interferers or clutter?

Most importantly, how do we diffuse a potentially volatile situation from beyond the horizon without collateral damage to the urban population?

For certain actions,
the ocean will still be the best "cloak of invisibility."

We might want to sneak in quietly and quickly, deliver the action,
and get out of there fast.

We claim the freedom,
if not the right,
of passage.

As I mentioned, we are exploring the speed versus power density game for under water, and we'll see if a tactically useful platform is feasible.

But even if we can move fast, there remain serious challenges.

Think for a moment about traveling in a high speed underwater craft and, upon detecting an obstacle, having less than 50 yards to clear it.

Implicit in that scenario are some really hard problems:

--What are all the ways to "see" and find things in the water column with high confidence,
and what level of confidence is required to make a spot decision?...

Turn right, or turn left?

Maybe it doesn't matter, or maybe it's catastrophic.

--How do we navigate accurately with no position referencing system like GPS?

Can we devise a precision underwater navigation approach that is available or employable anywhere?

--AND, there's still the communications problem, especially when we're traveling at high speed, and things are changing rapidly.

We've got to find the
Big Breakthrough in underwater comms.

I've just posed
one evolution of
one scenario that could occur in any of the

urban hot zones in the maritime theatre.

Hostilities rise and fall, and we have to be tuned in to all of them to ensure that we can exercise our dominance globally.

We project power by forward presence of our forces everywhere that hostilities are expected to develop.

In the new strategic environment, this is perhaps impractical, if not impossible.

As I've contended, the ocean is huge and hard to work in without expending a lot of resources.

We cannot be dependent on local hospitality, especially if we don't want the attention.

But global dominance demands an ability to operate anywhere we want.

We need to be able to operate with persistence.

And to do so we must be energy-independent.

This is a strategic necessity.

Think of the ocean,
not only as the vastness we have to cross,
or the harshness we have to survive, but as the bountiful supplier of
energy it can be.

We can have an unlimited source of fuel or energy if we can extract it,
and we can be locally
self-sufficient, not just for our maritime vessels,

but also for other assets as well.

--We know we can harness wind, waves and solar energy for offboard systems, but can we make fuel in quantities to sustain small forces from remote locations off shore?

What are the chemistries and processes needed to advance this capability?

If we're successful, our systems and forces can be self-sustaining over long periods of time, providing persistence and dominance --- empowering a global maritime watchkeeper, on station to maintain full domain awareness and capable of at-will engagement, whatever the call to action may be.

While we're thinking about the ocean as a strategic resource, I offer a couple more points to ponder:

Commercial activity in the oceans is increasing, and there is ever-expanding exploration and increased infrastructure on the sea floor.

Perhaps some of our defense maritime challenges can be addressed with a little innovation.

For instance, a local underwater infrastructure means access to power, energy, stable reference points, and fixed communication channels.

How can these investments be leveraged to give us new capabilities?

Meanwhile, the oceans are becoming more heavily instrumented by both the military and commercial sectors, dumping lots of data on the

internet daily.

In data, surely there is information.

Is there a “Google-Ocean” in the making?

Could it have strategic value to a COCOM?

With that,

I'd like to leave you with one parting thought:

The ocean is a strategic asset for a military commander.

As much as it's unpredictable, the one certainty is its constancy.

Let's exploit the future role of the ocean in the new strategic environment.

Thank you.

A second ago, I talked about exploiting the ocean's energy potential.

Now let me introduce someone bent on exploiting the tactical energy potential in just about anything -- the inimitable Doug Kirkpatrick.